

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No. 10/628,431

Q76597

AMENDMENTS TO THE DRAWINGS

**Please replace the current drawings with the formal drawings as submitted with the
Submission of Drawings submitted herewith**

Attachment: Six (6) Replacement Sheets

REMARKS

Claims 1-8, 11-26, and 28-37 are all the claims currently pending in this Application.

Claims 7 and 15-26 are withdrawn. Therefore, claims 1-6, 8, 11-14, and 28-37 are all the claims currently under consideration.

Drawings

The Examiner indicates that new, corrected drawings are required. With this Amendment, Applicants also file a Submission of Drawings along with six replacement sheets containing formal drawings for Figures 1-11.

35 U.S.C. § 101

Claims 1-6 and 28-32 stand rejected under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. Regarding this rejection, the Examiner asserts that the result achieved by the claimed invention is not “useful, tangible, and concrete.” The Examiner cites the 2005 Interim Guidelines. These Guidelines indeed explain that “the Federal Circuit examined some of its prior section 101 cases, observing that the claimed inventions in those cases were each for a ‘practical application of an abstract idea’ because the elements of the invention operated to produce a ‘useful, concrete and tangible result.’ *State Street*, 149 F. 3d at 1373-74.” The Guidelines go on to explain how a claim meets the requirements of producing a “useful, concrete, and tangible” result. Applicants submit that the claims, as exemplified by claim 1, clearly meet these requirements.

Useful. “The USPTO’s official interpretation of the utility requirement provides that the utility of an invention has to be i) specific, (ii) substantial and (iii) credible.” (Guidelines). The specification clearly sets forth that a method for determining the influencing of the state of

polarization of optical radiation by an optical system has a specific, substantial, and credible utility.

“In the case of modern high-precision imaging systems of high numerical aperture, used as microlithographic projection objectives, for example, the influence of the imaging system on the state of polarization of the radiation used can scarcely be neglected any longer. Thus, for example, polarization-induced effects on the image quality are produced by birefringence in the case of lenses made from calcium fluoride such as are frequently used for short wavelengths, and by polarization effects at deflecting mirrors. There is therefore a need to be able to determine the influencing of the state of polarization of optical imaging systems of high aperture as well as possible in quantitative terms, in order to draw conclusions on the polarization-dependent image quality.” (Specification, paragraph [09]). Clearly, as set forth in the specification, there is a need for methods of determining the influencing of the state of polarization of optical radiation by an optical system, as claimed.

Tangible. The Guidelines explain that “the tangible requirement does require that the claim must recite more than a Sec. 101 judicial exception, in that the process claim must set forth a practical application of that Sec. 101 judicial exception to produce a real-world result.” Applicants submit, as discussed above, that the claimed method has the practical application of determining the influencing state of polarization of optical radiation by an optical system. In other words, the method tests a property of the optical system. It is well-established that the testing of high-tech systems has a practical application and produces a real-world result.

Concrete. The Guidelines explain that “the process must have a result that can be substantially repeatable or the process must produce the same result again.” Applicants submit that the claimed process is repeatable.

Further. The Guidelines explain that “the claimed invention in *Arrhythmia* ‘constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it corresponded to a useful, concrete, and tangible thing — the condition of a patient’s heart.’” Applicants submit that, similarly, the presently-claimed invention corresponds to a useful, concrete, and tangible thing — the condition of an optical system.

Additionally, Applicants note that the Guidelines explain that “The Federal Circuit further ruled that it is of little relevance whether a claim is directed to a machine or process for the purpose of a Sec. 101 analysis.”

Claim Steps. The Examiner also asserts that “it would appear at a glance that the determination step may not be the final result of the claim.” Applicants respectfully request that the Examiner more carefully explain this opinion because it appears patently clear that in a claim directed to “A method for determining the influencing state of polarization of optical radiation by an optical system,” that a step of “determining the influencing state of polarization by the optical system by means of evaluating the measured exit state of polarization with reference to the entrance state of polarization” is the final result of the claim. In other words, it is clear that a step of determining an influencing state is the last step in a method of determining an influencing state.

Dependent Claims. The Examiner further asserts that “As for the dependent claims (2-6 and 29-32), these claims also only serve to further limit the already stated limitations of the

claims on which they depend.” Applicants respectfully submit that this is exactly the purpose of dependent claims, and Applicants request that the Examiner further explain any problems with the dependent claims.

In view of the above, Applicants respectfully request that the §101 rejection of the claims be reconsidered and withdrawn.

Prior Art Rejections

Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ouchi (2002/0024673) in view of Spanier (U.S. Patent 5,166,752). Claims 3, 28, and 29 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ouchi in view of Freischlad (U.S. Patent 6,061,133). Claim 4 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ouchi in view of Cyr (U.S. Patent 6,204,924). Claims 8, 12, 33, and 35 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ouchi in view of LaFleur (U.S. Patent 5,815,268). Claims 11 and 34 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ouchi in view of LaFleur and Freischlad. Claims 14 and 37 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ouchi in view of LaFleur and Cyr. Claim 30 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ouchi in view of Freischlad, Cyr, and Spanier (U.S. Patent 5,166,752).

Claims 1, 2, and 4. Claim 1 is amended herewith to make it explicit that the optical system is a microlithography objective. This amendment is fully supported by the originally-filed specification.

Spanier discloses the use of ellipsometry exclusively for examining thin layers or simple layered optical elements. It would not have been obvious to one of skill in the art that this type of

ellipsometry appliance for examining layered substrates could be used for polarization measurements of a much more complex projection objective. In particular, one of skill in the art, when considering the method as disclosed in Ouchi, which is specifically directed to a projection objective, would not have thought of replacing this method with an alternative method having completely different conditions of use, as is the case for the ellipsometry method examining layered substrates according to Spanier.

Further, as a matter of fact, the ellipsometry method is very time consuming, and in the case of a pupil-resolved measurement, a multiplicity of single measuring points have to be completed, which is another reason that one of skill in the art would not find it obvious to use an ellipsometry method for pupil-resolve polarization measurement. A very long measuring time would result so that the high precision required for a projection objective could hardly be maintained through the whole measurement time, and the effort for the measurement would be prohibitively high.

Applicants respectfully disagree with the Examiner's assertion that a motivation for using an ellipsometry method would be that an ellipsometric measurement would be more precise and more efficient. This is simply not true.

Therefore, in view of the above, Applicants submit that claim 1 is patentable over the cited references and that claims 2 and 4 are patentable at least by virtue of their dependence on claim 1.

Claim 3. Claim 3 is rewritten into independent form. Applicants submit that no reasonable combination of the cited references teaches or suggests "spatially incoherent point light radiation," as recited. Ouchi fails to disclose such radiation. Additionally Freischlad fails to

teach such radiation, but rather describes a spatially incoherent light source which is *not* spatially incoherent *point light* radiation. Namely, Freischlad explicitly mentions a fiber end face 28 to establish the light source having typical diameters from 0.5 mm to 1.0 mm. It is clear that a light source of such a diameter is not a point light source. Further, Applicants note that there is no motivation to replace the laser light source of Ouchi, which emits linearly polarized light, with the light source of Freischlad. The motivation discussed by the Examiner actually contradicts the use of a point light radiation source, because spreading out the light source over a broader spatial range, as discussed by the Examiner, would teach away from the use of a point light source.

Therefore, Applicants submit that claim 3 is patentable over the cited references and respectfully request that the rejection of claim 3 be reconsidered and withdrawn.

Claims 8, 11, 12, and 14. Applicants submit that there is no motivation in the references or in the knowledge available to one of skill in the art to combine Ouchi and LaFleur as suggested by the Examiner. Namely, LaFleur is directed to improved measurement techniques in which measurements have to be made for each of a plurality of field positions separately. Instead of using one point light source to be displaced to the various field points, LaFleur teaches to use a binary optic 12, representing an array of point sources on the object side of the lens under test. Ouchi does not use such single field point measurement, but rather uses a measurement technique by which the whole measurement beam and thus all field points are simultaneously illuminated and evaluated using a two-dimensionally extended laser light beam and a two-dimensionally detecting camera. In the measurement technique of Ouchi, the drawback treated by LaFleur, namely having to make a plurality of single measurements for each of a corresponding plurality of point light sources at different points, is not treated, and therefore,

there is no motivation to replace the light source of Ouchi with the array pf point light sources with the first binary optic of LaFleur.

Therefore, in view of the above, Applicants submit that claim 8 is patentable over the cited references, and that claims 11, 12, and 14 are patentable at least by virtue of their dependence on claim 8. Applicants respectfully request that the rejection of claims 8, 11, 12, and 14 be reconsidered and withdrawn.

Claims 28, 29, and 30. Applicants submit that claim 28 is patentable for at least those reasons as presented above with respect to claim 3, and that claims 29 and 30 are patentable at least by virtue of their dependence on claim 28. Applicants respectfully request that the rejection of claims 28, 29, and 30 be reconsidered and withdrawn.

Claims 33, 34, 35, and 37. Applicants submit that claim 33 is patentable for at least those reasons as presented above with respect to claim 8, and that claims 34, 35, and 37 are patentable at least by virtue of their dependence on claim 33. Applicants respectfully request that the rejection of claims 33, 34, 35, and 37 be reconsidered and withdrawn.

Allowable Subject Matter

The Examiner indicates that claims 5, 6, 13, 31, 32, and 36 contain allowable subject matter and would be allowed if rewritten into independent form, incorporating the limitations of the claims from which they depend.

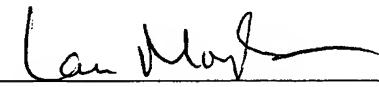
Claim 5 is rewritten into independent form. Claim 6 depends from claim 5. Claim 13 is rewritten into independent form. Claim 31 is rewritten into independent form. Claim 32 depends from claim 31. Claim 36 is rewritten into independent form. Applicants respectfully request allowance of claims 5, 6, 13, 31, 32, and 36.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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